SUPPORT FOR THE AMENDMENTS

The present amendment cancels claims 1 and 2, and amends claims 4, 5, 9, 10, 16-19 and 21. Support for these amendments is provided by the originally filed claims and specification. Support for the amendment to claims 4, 5, 9, 10, 16-19 and 21 can be found, for example, at the abstract, paragraphs [0039]-[0045] and [0048], and original claim 3, of Iwakuma '698 (U.S. 2007/0172698), which is the U.S. pre-grant publication of the originally filed application. It is believed that these amendments have not resulted in the introduction of new matter.

REMARKS

Claims 3-19 and 21-28 are currently pending in the present application. Claims 1 and 2 have been cancelled, and claims 4, 5, 9, 10, 16-19 and 21 have been amended, by the present amendment.

Applicants wish to extend their appreciation to Supervisory Examiner Tarazano and Examiner Yang for the helpful and courteous discussion held on February 22, 2011 with their undersigned Representative. During the meeting, the prior art rejections were discussed, along with potential claim amendments, arguments and/or evidence for overcoming the rejections. The content of this discussion is believed to be reflected in the remarks set forth herein.

The rejections under 35 U.S.C. § 103(a) of: (1) claims 1-6, 8-10, 12, 14-19 and 21-25 as being obvious over Higashi (U.S. Patent 6,617,051) in view of Begley (U.S. 2005/0095453); (2) claims 7, 11 and 13 as being obvious over Higashi in view of Begley and Hu (U.S. Patent 6,479,172); and (3) claims 26-28 as being obvious over Higashi in view of Begley and Iwakuma '745 (U.S. 2004/0086745), are respectfully traversed with respect to claims 3-19 and 21-28.

Claim 3 recites an organic electroluminescent device in which an organic thin film layer comprising a single layer or plural layers comprising a phosphorescent light-emitting layer comprising at least a host material and a phosphorescent organic metal complex is interposed between a cathode and an anode, wherein a halogen element mass concentration of *bromine* which is contained as an impurity in the host material of the phosphorescent light-emitting layer is *30 ppm or less*.

Higashi, Begley, Hu and Iwakuma '745, when considered alone or in combination, fail to render obvious to a skilled artisan the organic electroluminescent device of the present invention comprising a phosphorescent light-emitting layer, wherein a halogen element mass concentration of *bromine* which is contained as an impurity in the phosphorescent light-emitting layer is 30 ppm or less, as presently claimed. Higashi fails to exemplify that any method described therein actually produces an organic electroluminescent device comprising a phosphorescent light-emitting layer, wherein the bromine impurity is 30 ppm or less, as presently claimed.

Assuming arguendo that sufficient motivation and guidance, as well as an enabling disclosure, is considered to have been provided by Higashi, Begley, Hu and/or Iwakuma '745 to direct a skilled to arrive at the organic electroluminescent device of the present invention, which is clearly not the case, such a case of obviousness is rebutted by a showing of unexpected results.

As discussed in the present specification and shown by the comparative experimental data presented therein, Applicants have discovered that an organic electroluminescent device, which comprises a phosphorescent light-emitting layer having a bromine mass concentration of 30 ppm or less in accordance with an exemplary aspect of the present invention, surprisingly exhibited a remarkable degree of improvement with respect to drastically enhanced performance, prolonged half lifetime, and desirably reduced operating/driving voltage, as compared to the inferior properties of decreased performance, shortened half lifetime, and undesirably increased operating/driving voltage exhibited by a traditional organic electroluminescent device, which comprises a conventional phosphorescent light-emitting layer having a bromine mass concentration outside the claimed range of 30 ppm or less (See e.g., abstract, paragraphs [0001], [0012], [0023]-[0030], [0039]-[0045], [0048], [0141]-[0144], [0147]-[0149], [0178]-[0186], [0204], Figs. 1, 2, 4 and 5, as well as original claim 3, of Iwakuma '698 (U.S. 2007/0172698), which is the U.S. pre-grant publication of the originally filed application).

As shown in Table A below, which compiles into tabular form the comparative experimental data presented in the present specification, the inventive organic electroluminescent device 2 of Example 1 comprising a phosphorescent light-emitting layer having a bromine mass concentration of 30 ppm or less in accordance with an exemplary aspect of the present invention surprisingly exhibited superior properties with respect to an unexpectedly reduced operating/driving voltage of only 1.15 V and an unexpectedly prolonged half lifetime of 467 hours.

In contrast, the traditional organic electroluminescent device 1 of Comparative Example 1 comprising a conventional phosphorescent light-emitting layer having a bromine mass concentration outside the claimed range of 30 ppm or less exhibited inferior properties with respect to an undesirably increased operating/driving voltage of 1.51 V and a shortened half lifetime of only 70 hours.

Table A

Device	Example	Br (ppm)	I (ppm)	Cl (ppm)	Total Halide (ppm)	Operating/ Driving Voltage (V)	Half Lifetime (Hours)
1	Comp. Ex. 1	325	10	22	357	1.51	70
2	Ex. 1	17	5	7	29	1.15	467

As shown in Table B below, which compiles into tabular form the comparative experimental data presented in the present specification, the inventive organic electroluminescent device 5-7 of Examples 3-5, respectively, comprising a phosphorescent light-emitting layer having a bromine mass concentration of 30 ppm or less in accordance with an exemplary aspect of the present invention surprisingly exhibited superior properties with respect to an unexpectedly reduced operating/driving voltage of only 0.45 V, 0.21 V, and 0.24 V, respectively, and an unexpectedly prolonged half lifetime of 1083 hours, 3988 hours and 4623 hours, respectively.

In contrast, the traditional organic electroluminescent device 8 of Comparative Example 3 comprising a conventional phosphorescent light-emitting layer having a bromine mass concentration outside the claimed range of 30 ppm or less exhibited inferior properties with respect to an undesirably increased operating/driving voltage of 0.92 V and a shortened half lifetime of only 57 hours.

Table B

Device	Example	Br (ppm)	I (ppm)	Cl (ppm)	Total Halide (ppm)	Operating/ Driving Voltage (V)	Half Lifetime (Hours)
5	Ex. 3	24	5	4	33	0.45	1083
6	Ex. 4	16	4	5	25	0.21	3988
7	Ex. 5	13	4	3	20	0.24	4623
8	Comp. Ex. 3	390	10	10	410	0.92	57

This evidence clearly demonstrates that the claimed organic electroluminescent device comprising a phosphorescent light-emitting layer having a bromine mass concentration of 30 ppm or less in accordance with an exemplary aspect of the present invention surprisingly exhibits superior properties with respect to an unexpectedly reduced operating/driving voltage and an unexpectedly prolonged half lifetime. This evidence also demonstrates the important influence that bromine mass concentration has on the properties exhibited by an organic electroluminescent device comprising a phosphorescent light-emitting layer containing bromine.

Based on the limited disclosures of the cited references, one of ordinary skill in the art could not have reasonably predicted that the operative/driving voltage and the half lifetime of the organic electroluminescent device could be drastically reduced and prolonged, respectively, by limiting the bromine mass concentration to an amount of 30 ppm or less, as presently claimed, thereby precluding a prima facie case of obviousness.

Withdrawal of these grounds of rejections is respectfully requested.

In conclusion, Applicants submit that the present application is now in condition for allowance and notification to this effect is earnestly solicited.

Respectfully submitted,

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